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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/339,869	06/25/1999	JUN KOIDE	35.C13613	3159

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EXAMINER

TUGBANG, ANTHONY D

ART UNIT	PAPER NUMBER
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3729

DATE MAILED: 08/18/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/339,869

Applicant(s)

KOIDE ET AL.

Examiner

A. Dexter Tugbang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 May 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3 and 5-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. The applicants' amendment filed 5/29/03 (Paper No. 19) has been fully considered and made of record.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

3. Claims 1-3 and 6-15 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In Claim 1, the phrase of "a single discharge port" (lines 9-10) is unclear if this is referring to the phrases of either "an discharge port" (line 1) or "discharge ports" (line 2), previously recited in the preamble. Is the "single discharge port" of a different group than the ones recited in the preamble? Similar problems occur in Claim 6.

Claim Rejections - 35 USC § 102

4. Claims 1-3, 6-10 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated Nishiwaki et al 5,263,250.

Nishiwaki discloses a method of processing an ink discharge port for manufacturing an ink jet head comprising: closely contacting a mask plate 8 (see col. 5, lines 55-57) having openings corresponding to discharge ports on a discharge port plate 12 with a face of the

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discharge port plate on an ink discharge side (see col. 4, lines 57+); and forming the discharge port on the discharge port plate by irradiating a high energy ultraviolet excimer laser simultaneously through the mask plate so that the laser is inclined with respect to a vertical axis that is perpendicular to the mask plate (see Fig. 3 and col. 5, lines 45-50). In Figures 1 and 3, the discharge ports eventually form a shape, which is widened to a dimension or direction away from a source 2 of the beams and these beams approach the discharge port plate 12 to a particular region from different directions.

With regards to Claims 2, 3, 8 and 9, Nishiwaki further teaches that the symmetry of incident beams are clearly symmetrical, have the same angle, and are equally divided with respect to a vertical X-axis (shown in both Figures 2 and 3). Further regarding Claims 3 and 9, Nishiwaki additionally teaches a division of beams that is within a "circumference of a circle" as indicated by the circle in Figure 4.

With respect to Claim 7, Nishiwaki further teaches that the discharging port forming step of forming the discharging ports by irradiating high energy beams simultaneously can be performed after the discharge port plate, i.e. nozzle plate, is bonded or fastened to an ink jet main body (see col. 6, lines 64-68).

With respect to Claim 10, Nishiwaki shows (in Fig. 2) that the high ultraviolet beams comprise of at least two beams with each being inclined symmetrically with respect to the vertical X-axis of the mask plate 8 and are incident upon the mask plate in a direction at right angles to an axis along an arrangement direction of the discharge ports. It is noted that the "arrangement direction" can be any direction selected such that it would be at right angles incident from the mask plate.

Claim Rejections - 35 USC § 103

5. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiwaki.

Nishiwaki discloses the claimed manufacturing method as relied upon above, further including that the high ultraviolet beams comprise of at least four beams (see Fig. 2). However, to choose any desired specific angle of irradiation of the incident beams in relationship to the arrangement direction of the discharge port is an obvious matter of design choice, since the Applicants have not disclosed that the claimed *angle of 45 °* solves any stated problem or is for any particular purpose, and it appears that the invention would perform equally well with the various angles of incident beams taught by Nishiwaki'250.

6. Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiwaki'250 in view of Japanese Patent Publication JP 2-187346, referred to hereinafter as JP'346.

Nishiwaki discloses the claimed manufacturing method as relied upon above. Nishiwaki does not teach that 1) the ink flow paths are rectangular in shape, and 2) that the discharge port plate is formed by a material of resin.

JP'346 shows an ink jet head in which corresponding ink flow paths 14 (in Fig. 9) are rectangular in shape and are connected to a discharge port plate 10. JP'346 teaches that the discharge port plate is made of a resin material, which is ablated by laser beams to form the discharge ports 11, and that the rectangular ink flow paths 14 are formed by the laser beams after the discharge ports are formed (see Purpose). An advantage of the above process and material

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provides the necessary amount of jet-out speed for the ink drops onto a medium, i.e. paper (again, see Purpose).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the method of Nishiwaki by forming the ink flow path rectangular in shape and the discharge port plate with a resin material, as taught by JP'346, to positively provide an operational ink jet head with the necessary amount of jet-out speed for the ink drops onto the medium.

7. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nishiwaki in view of Muto 5,548,894, referred to hereinafter as Muto'894.

Nishiwaki discloses the claimed manufacturing method as relied upon above. Nishiwaki does not teach that the discharge port plate is formed of silicon nitride.

Muto'894 teaches that forming discharge port plates (nozzle plate 61) can be accomplished by conventional, art recognized equivalent materials of either resin or silicon nitride (see col. 25, line 55 to col. 26, line 16). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have formed the discharge port plate of Nishiwaki, alternatively, with such conventional, art recognized equivalent materials with compositions of either resin or silicon nitride, to produce equivalent art recognized discharge port plates.

Response to Arguments

8. Applicant's arguments filed 5/29/03 (Paper No. 19) have not been deemed to found as persuasive.

In regards to the merits of Nishiwaki, the applicants' contend that Nishiwaki does not teach that the formed discharge port has a shape that widens in a direction away from a source of the beams.

The examiner most respectfully disagrees. In Nishiwaki, the discharge port plate (nozzle plate) initially has no holes in it prior to the beams being irradiated on it. During irradiation, the holes are formed from one side of the discharge port plate, to the other side of the discharge port plate opposite from the laser source 2. Thus, the mere formation of the holes during the duration of the irradiation of the beams would suffice to say that the discharge ports would have a "shape that widens in a direction away from a source of the beams". It is noted that the claims do not recite any particular shape of the holes being formed.

With respect to the combination of references with EP' 146 utilized in the previous Office Action (Paper No. 17), these arguments are now considered to be moot in light of the new grounds of rejection set forth above with Nishiwaki.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

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will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dexter Tugbang whose telephone number is 703-308-7599. The examiner can normally be reached on Monday - Friday 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 703-308-1789. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-3590 for regular communications and 703-305-3588 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0858.



A. Dexter Tugbang
Primary Examiner
Art Unit 3729

August 18, 2003